ractice: wksht 1.3A

1. **Suppose the average (mean) price of gas in a large city is $1.80 per gallon with a standard deviation of $0.05.**

   a. Convert $1.90 and $1.65 to *z*-scores.

   $z = 2$ $\quad$ $z = -3$ $\quad$ $N(1.80, 0.05)$

   b. Convert the following *z*-scores back into actual values: 1.80 and –1.60.

   $1.80 = \frac{X - 1.8}{0.05}$ $\quad$ $X = \$1.89$

   $-1.6 = \frac{X - 1.8}{0.05}$ $\quad$ $X = \$1.72$

2. **Suppose the attendance at movie theater averages 780 with a standard deviation of 40.**

   a. An attendance of 835 equals a *z*-score of:

   $N(780, 40)$

   $z = 1.375$

   b. A *z*-score of –2.15 corresponds to an attendance of:

   $-2.15 = \frac{X - 780}{40}$ $\quad$ $X = 694$

3. **A packing machine is set to fill a cardboard box with a mean of 16.1 ounces of cereal. Suppose the amounts per box form a normal distribution with a standard deviation equal to 0.04 ounce.**

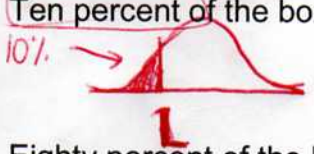
   $N(16.1, 0.04)$

   a. What percentage of the boxes will end up with at least 1 pound of cereal?

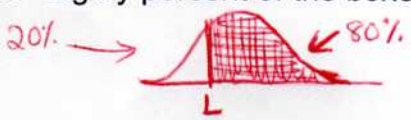
   $P(X > 16) = \text{normalcdf}(16, E99, 16.1, 0.04) = 0.9938$

   b. Ten percent of the boxes will contain less than what number of ounces?

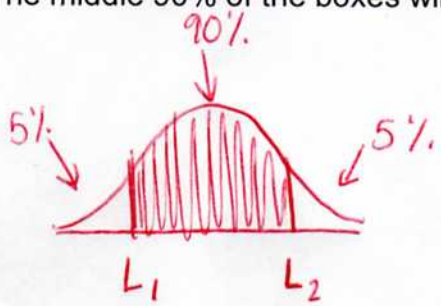
   $P(X < L) = 0.10$ $\quad$ $L = \text{invnorm}(0.10, 16.1, 0.04)$

   c. Eighty percent of the boxes will contain more than what number of ounces?

   $P(X < L) = 0.20$ $\quad$ $L = \text{invnorm}(0.2, 16.1, 0.04) = 16.049 \text{ oz}$

   d. The middle 90% of the boxes will be between what two weights?

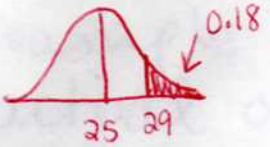
   

   $L_1 = \text{invnorm}(0.05, 16.1, 0.04) = 16.034 \text{ oz}$

   $L_2 = \text{invnorm}(0.95, 16.1, 0.04) = 16.166 \text{ oz}$

   $P(L_1 < X < L_2) = 0.9$

4. **Given a normal distribution with a mean of 25, what is the standard deviation if 18% of the values are above 29?**



z-score for 29 : invnorm(0.82, 0, 1) = 0.9154

$0.9154 = \frac{29-25}{\sigma}$

$\sigma = 4.37$

5. **The life expectancy of wood bats is normally distributed with a mean of 60 days and a standard deviation of 17 days.**

$N(60, 17)$

a. What is the probability that a randomly chosen bat will last at least 60 days?

$P(x > 60) = 0.50$ *60 is the mean

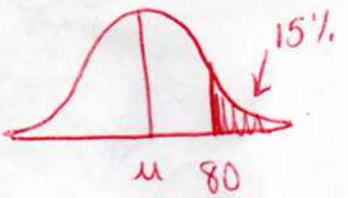
b. What percentage of bats will last between 40 and 80 days?

$P(40 < X < 80) = 0.761$ normalcdf(40, 80, 60, 17)

c. What is the probability that a bat will break during the first month? (30 days)

$P(x < 30) = 0.0388$ normalcdf(-E99, 3

6. **Given a normal distribution with a standard deviation of 15, find μ if 15% of the values fall above 80.**



z-score for 80: invnorm(0.85, 0, 1) = 1.0

$1.036 = \frac{80-\mu}{15}$

$\mu = 64.46$